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## **THE PHILOSOPHIES OF SCIENCE IN DEVELOPING NURSING SCIENCE** **DISCUSSION PAPER/ PHILOSOPHICAL PAPER**

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<b>ABSTRACT</b>	<b>Keywords</b>
<p>During the successive wave of globalization, nurses emphasized the requirement of specialized knowledge to improve the nursing as a profession and to make the transition from vocation to profession. The science of nursing is a foundation of knowing for nurses. Also there has a shift of nursing metaparadigm based on Kuhn's philosophy of science. It was assumed that Philosophies are theoretical works that included one or more of the metaparadigm concepts.</p> <p>Philosophy provide us broad general view of what is science and human science, evolution of science, function of scientific theory, scientific methodologies, different philosophical approaches, significant philosophical shift in different eras and it would be helpful for the development of nursing as a discipline from adhering to the knowledge that we learnt in this paper.</p>	<p><b>Philosophy, Nursing</b></p>

During the successive wave of globalization, nurses emphasized the requirement of specialized knowledge to improve nursing as a profession and to make the transition from vocation to a profession. The science of nursing is a foundation of knowledge for nurses (Carper, 1999). Also, there has a shift in nursing metaparadigm based on Kuhn's

philosophy of science (Fawcett, 2005). It was assumed that Philosophies are theoretical works that included one or more of the metaparadigm concepts.

The philosophies of science in this paper focus on the questions of:

1. "Do humans have a natural inclination to do science?"

2. What is science's central question?
3. How did science evolve as a way of building knowledge?
4. How does one know how to practice the art of nursing?
5. Why does nursing concern itself with science?
6. How does theory relate to science?
7. What is the process of theory testing?
8. How shall we judge the truth of claims?

Before answering all questions, first of all, we would need to understand the meaning of science, and what is science? Although there is the various point of view regarding the meaning of science, it is concluded that science uses the specific process to produce knowledge or theory for the purpose of understanding (descriptive), explaining (prescriptive), and predicting (predictive) of the natural diversity of the world we live. Therefore, science can be assumed as 'a history of corrected mistakes' (Okasha, 2016). According to Aristotle, all man has a natural desire to know (Okasha, 2016). Also, from my point of view, all humans have a natural tendency to do science since they were born. When we are in childhood, we learned every new thing through observation with our five senses of what others saying, doing, and how they interpreted it. For examples, when we were touching the hot stove, we felt something terribly and the parents might say that 'it is hot, it is dangerous for you' like that. After that, we learned how we can prevent this

terrible feeling of hot and then, buffering with some materials and acting to prevent hot. Finally, we understood the phenomena of hot through observations and experiments, and we shared and explained our experience to others and we also can predict it before occurs. In my opinion, it is one type of research that we did in childhood. Therefore, all living things in the world especially human beings learned every new thing step by step according to their development processes to understand, explain and predict the world we live in. So who can say that human has no tendency to do science, they all are absolutely having the natural tendency to do science.

Regarding the science's central question, "Why?" is one of the most significant questions of empirical science (Hempel, 1967). Science uses experimentation and careful observation as a distinctive method of inquiry from non-scientific discipline. The scientist tries to explain why things happen, how it works and their important by constructing the general theory which leads to innovative technology such as Law of planet motion, Law of free fall. However, one limitation of science is there are no simple criteria to distinguish among science and pseudo-science. In addition, theories in science conflict with some observation, it means that finding the theories that perfectly fit all data is difficult. If the theory consistently conflicts with more and more data and no

plausible way to explain these conflicts, then the theory will be finally rejected (eg. Kuhn's perspective of science). Falsifiability is one of the distinctive features of science. There must be a way to empirically and logically falsify the theory by using the principle of deductive (Popper, 2005). In contrast, verification of theory use inductive analysis (Carnap, 1962), thus it would be impossible to verify all things. Obviously, art, astrology, and technology are quite different from science. However, religion seeks to explain the meaning of human existence, to define the nature of the human soul, to justify the existence of an afterlife for humans, and to maintain devotion to people. Similar to religion, the feature of science is explaining the origin, nature, and process of the physically detectable universe. It is the way of finding the empirical truth in both religion and science. Contrastingly, art is very individualistic and its expression of one's ideas or feelings about something in a beautiful way. Therefore, art is very individualistic.

In addition, apart from natural and social science, nursing science has to deal with human beings as their subject. Therefore, it is undeniably true that nursing science is a combination of art and science and the awareness of the perspective of nursing as a human science has risen (Cody & Mitchell, 2002). In addition, the pattern of socialization in the human being is diverse and unique from others. Therefore, it was

sure that human behavior was almost totally unpredictable, and thus there is no particular standard method to measure it (Bernstein, 2011). Human science in nursing gives value to human experience and understands all particular aspects of human life which cannot be adequately described, explained, or analyzed through objectification, measurement or reduction (Mitchell & Cody, 2013). Apart from other sciences, human science conceptualized human being as intentional and naturally free-willed. On the other hand, natural science is the study of the physical universe and it can't measure intangible things of human thought, emotion, and feelings (Meleis, 2011). Also, it is obviously undeniable that natural science can only test and observe existing physical evidence using the analytic-synthetic method. Moreover, there is no set of value in natural science and use the standard as a value for measurement accuracy. Therefore, human science or the science-art becomes a bridge to minimize the discrepancies between nursing science and natural science's epistemology, ontology and axiology.

Moreover, science and knowledge were used interchangeably. Knowledge refers to knowing that is expressed in a form that can be shared and communicated to others. Science has been recognized as a more specialized form of knowledge, full of specific methodologies and ways to evaluate credibility. Science uses physical evidence

to answer the questions and relies on modern humans to make the inference from that evidence. Then, science becomes knowledge by publication of its results or by writing it in the text. This process is what we called doing research. However, science can only reach the best possible conclusion based on the most complete and modern evidence available. Scientists generate a body of knowledge with enough certainty but we can't know many things with absolute certainty. We know that future evidence may cause refinement, revision, or even rejection of today's theories. Our present theories have been tested against to make more sense in light of data generated by future scientists. In such a way that science builds the knowledge which is able to demonstrate, replicate or draw conclusions about the natural world, social world or human world.

Additionally, nursing is a practice discipline with distinguished professional characteristics which focus on humanistic philosophy (Gortner, 1990). There are fundamental patterns of knowing in nursing including empirics, aesthetics, personal knowing, ethics, emancipatory knowing and the praxis of nursing (Jacobs-Kramer & Chinn, 1988). These also are the holistic guiding frameworks for the development of nursing theories, practices, and moral disciplines. Among them, emancipatory knowing emphasized the social and political context of nursing and health care and critiques the four fundamental patterns of

knowing. These knowing turns into knowledge by problem-based learning, clinical supervision, and structured reflection on practice. Therefore, nursing concern itself with science.

Furthermore, science can be considered as the paradigm of knowledge inquiry. This paradigm uses empirical indicators to generate an organized body of knowledge along with the construction of the theory (Kuhn, 1970). Scientists explain this empirical evidence in terms of the general theory to understand explain and predict natural phenomena of the world and the people who live in. Therefore, the function of a theory is to provide a relatively consistent and particular structure for the scientific interpretation of complex human behaviors, and situations. Theories are the abstract structure that link many observable hypotheses together as a whole. In addition, a theory is an alternative form of empirical evidence for the framework of quality research (Fawcett & Garity, 2009). Theories, along with their philosophical bases and discipline-specific goals or outcome serve as a foundation for knowledge development and further practice of innovation (McCurry, Revell, & Roy, 2010).

The theory is a conceptual system invented to some purpose. And a good theory; a true or valid theory is a theory that in fact fulfills the purpose for which the theory was proposed or invented (Dickoff &

James, 1968). The test of any theory is whether application of it leads to more enlightened and more effective practice in the domain of experience covered by the theory. Inconsistent with the pragmatist's conception, nursing is a practical endeavor, the truth of their theories is what works in patient health care interest (Bernstein, 2011). It means that if the desired expected result is actually attained, then the hypothesis, under which action was taken, is to be accepted as true. Therefore, the validity and value of the theory depend on the accomplishing of their proposed work.

Obviously, the purpose of science was seeking the truth of knowledge, though we may not know the things with absolute certainty. Science can only seek theories which provide the best possible conclusion to generate a body of knowledge with enough certainty. The theory gives some definite prediction which is capable of being tested against experience. Those theories will probably be refined in the future, and some of them may even be discarded in favor of theories that make more sense in light of data generated by future scientists.

Lastly, the truth of a claim can be judged by the process of verification, validation, and falsification. However, since the nature of science is inductive, it is impossible to verify all things (Carnap). Falsifiability depends on the process of deduction as opposed to verification (Popper). Enumerative induction

(induction), hypothetico-deductive method (deduction), and inference to the best explanation (Abduction) are the methods of scientific reasoning or argument used to test the truth of claim (Hume, 2006). An argument may also be used to refer to a logical demonstration of the relation between premises and conclusion (Bardman, 1995). In the deductive argument, if all the premises are true, the conclusion must be true. Contrastingly, an inductive argument, if all of the premises are true, the conclusion probably true.

At the end of this discussion, philosophy provide us broad general view of what is science and human science, evolution of science, function of scientific theory, scientific methodologies, different philosophical approaches, significant philosophical shift in different eras and it would be helpful for the development of nursing as a discipline from adhering to the knowledge that we learned in this paper.

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